Spending a Year With the 45th Space Wing

by
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If NASA were to give you the opportunity to work a year-long assignment outside of the agency in an effort to broaden your experiences and skills as a NASA leader of the future, where would you go? That is exactly what NASA challenged me to determine as a member of this year's Leadership Development Program. I looked at a number of different options, but it was not until I met with Mr. Peter Taddie, Chief Engineer of the 45th Space Wing Office of Safety, and discussed the Range Safety "Concept to Launch" process that I made up my mind. In this article, I share some of my experiences, insights, and perspectives as a NASA leader who was given this unique opportunity.

Keeping the Columbia Accident Investigation Board report in mind, a primary goal of this assignment was to take a seasoned NASA engineer like myself from the engineering ranks and significantly increase my safety awareness and safety engineering competence for the future. Another primary goal was to become deeply imbedded in another culture, in this case the Air Force culture, while at the same time experiencing the NASA culture from an outside perspective.

Safety Awareness and Safety Engineering

As I began working with the 45th Space Wing, I learned that for all launches off the Eastern Range, the 45th Space Wing has established a world class safety program. Led by Colonel David Nuckles, the Space Wing's well trained professionals ensure safety compliance for all of these launches. Safety criteria include mission planning documentation, waivers, meets intent certifications, launch requirements, flight plan approval, launch commit criteria, mission rules,

and a final recommendation to the launch decision authority to proceed to launch from a safety perspective. Their tireless efforts protect lives and property by providing outstanding risk management.

Additionally, Space Wing personnel provide safety for all operations at the Eastern Range, including flight termination systems, explosives, blast and toxics, and hazardous and safety critical system review while holding true to their vision to exceed customer expectations by providing responsive, timely, reliable, and cost-effective safety support. Another group reviews plans and specifications for new construction, major building alterations, and/or changes in installation equipment and monitors the project through completion to ensure compliance with safety codes and standards.

Since before the days of Apollo, the 45th Space Wing has provided this kind of consistent top quality range safety engineering to NASA for Shuttle, expendable launch vehicle, and related payload launches and landings. United in mission and reinforced by the "Webb-McNamara" agreement, NASA and the Air Force continue to work together as much as possible to provide maximum mutual assistance and minimum duplication. We plan to successfully continue our business in this way for many generations to come. This Leadership Development Program assignment was yet another important step in this on-going critical partnership as we march with the 45th Space Wing in support of our agency's "Vision for Space Exploration."

The Air Force Culture

With my new found colleagues, I daily embraced and lived the Air Force primary value of "Integrity First." There is a serious and incredible awareness that we are a nation at war, while at the same time, there is time made for the lighter side. "Battle" language and imagery is often used throughout the day even when the subject matter and environment are not really hostile. There is a strong internal bond. However, this strong internal bond is nicely mixed with a sense of a true desire for inclusion. For example, despite significant on-going range safety discussions between NASA and the Air Force in the weeks just before my arrival, I was made to feel welcome and was quickly taken in.

Trust increasingly began to build between us, and soon all of the various team members and senior leadership were including me in their daily technical and political struggles and successes as I shared related NASA experiences and insights. I suspect that the Air Force/NASA relationship probably works that way across many of our fronts, so I see much hope and value in our continuing to partner in our business dealings and space adventures.

As in NASA, there is also a genuine desire for a "One NASA" like mentality and supporting behavior in the Air Force. To that end, my experiences in the 45th

Space Wing Office of Safety were very much like my experiences in the NASA Spacelab and Space Station organizations because they all were and are filled with well educated and experienced, “hands-on,” fully engaged engineers, both civil servant and contractor, with high energy “can do” attitudes. They know they can get the job done while keeping in mind that there is always another option to explore while meeting hard requirements, tailoring others, and diligently waiving what can be responsibly waived. After these experiences, I would assert that we have much more in common and much more to celebrate than not.

Other Areas with NASA Ties

In addition to achieving these high level goals, I worked several other specific, exciting areas that have strong NASA ties.

Quest for Successful Launch Attempts. Early in my assignment, I worked four launch attempts from the Range Operations Control Center range safety console. One of these was the successful Atlas V launch with the NASA Mars Reconnaissance Orbiter payload on board. Not surprisingly, the three scrubs proved invaluable for learning. During the scrubs, our safety console worked several important range safety issues:

- Tracking and clearing a ship from the danger area
- Clearing excessive personnel from a dangerous area
- Flight termination system battery and command receiver decoder technical issues
- Weather balloon temperature inversion issues that affected blast and toxic calculations for Port Canaveral
- Composite overwrap pressure vessel safety critical cycle issues and related follow-on personnel access safety concerns

All of this made it clear to me that we all want to launch and move forward, but only after all of the risks have been understood, weighed, mitigated, or accepted responsibly.

Quest for Best Practices. NASA has asked the Air Force to help in the development of the new Expendable Launch Vehicle Payload Ground Safety Review Process NASA Procedural Requirements Document with the goal of incorporating Air Force “best practices” in the NASA process and making our processes across all of our centers and all the affected agencies as consistent as possible for us and our customers. On a related note, it became obvious to me that we are all becoming increasingly aware that we are in competition for business regionally, nationally, and internationally.

During this assignment, I recognized that we have many management and technical issues in common, and that we also have many resolution tools and techniques in common. It is through our critical partnership and sharing of best practices and ideas that we achieve even more outstanding performance across both of our organizations. This was exactly the kind of important common ground and "best practices" collaboration that I was seeking as one of my goals during this assignment with the Air Force.

Quest for Future NASA Involvement. The Florida Space Authority, Florida Tech, Embry Riddle, and the 45th Space Wing engaged in a visionary meeting about the "Pioneer Cup" competition where colleges would compete in the development and launch of small rockets and payloads to a pre-selected location. It was exactly the kind of senior visionary leadership meetings that I know NASA's Leadership Development Program is all about. I found it interesting that NASA was not part of this project, but NASA may be in the future and I worked some side projects to that end.

Quest for New Vehicles. Kistler executives met with the 45th Space Wing on the progress and future of potentially launching and landing their rocket from the Cape. Coming from a Space Station organization, I find Kistler very interesting because their executives talked about the potential for significant payload down mass from station which would be a huge boost in the arm for a potentially significant increase in station science, a topic that is very near and dear to my heart. The reusable vehicle is proposed to be turned around very quickly. The concept also has very interesting range safety issues because it returns vehicles to the launch site.

Looking to the Future

In conclusion, these new colleagues at the 45th Space Wing are very competent engineers who are open, honest, and hold very little back. From them, I received genuine support and excitement about NASA; our new NASA Administrator, Mike Griffin; and what he, along with the rest of us, are doing to implement our vision for space exploration.

It appears to me that achievement of this vision will take a measured blend of the old and the new—both in people and technologies. As my mentor and friend Mr. Peter Taddie so aptly told me, it looks like we are all going "back to the future." NASA's Leadership Development Program is about taking the time to develop the people who are going to help lead and create that new future. I would be very pleased if that future ends up with me once again working with the fine people I have met at the 45th Space Wing.

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